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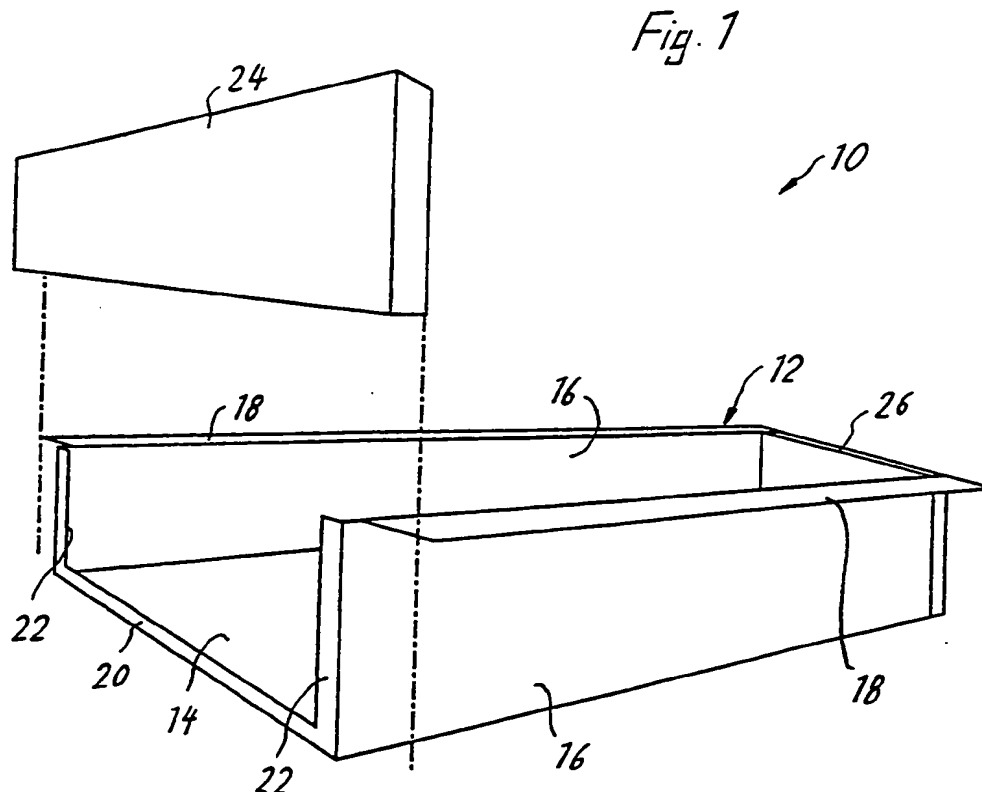
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(54) **Sheet metal drawer**

(57) Sheet metal drawer having a plastics material front part, is characterised in that a sheet metal part forming the base and the side walls of the drawer is open at least at the front; and in that the front wall of the drawer is formed directly by the plastics material front part which is provided on its rear surface or on its edges with grooves in which the front edges of the sheet metal part and/or flanges on the sheet metal part engage.



**GB 2 255 000 A**

Fig. 1

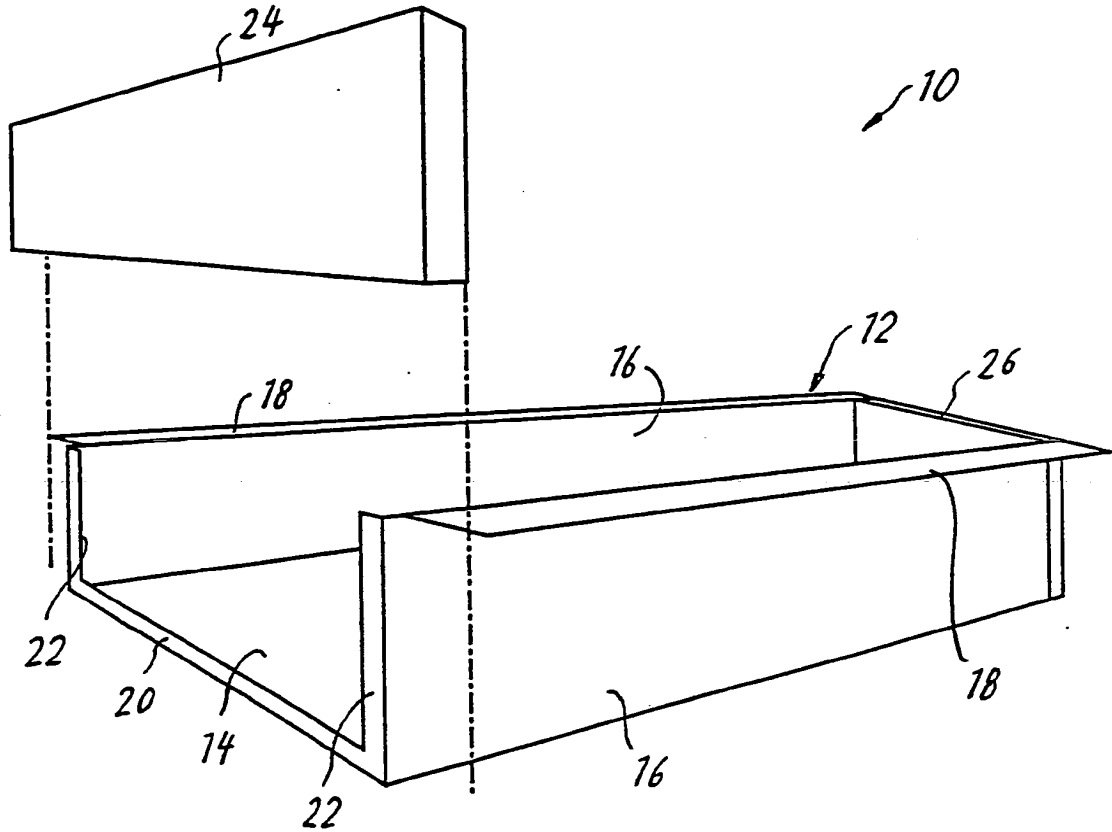
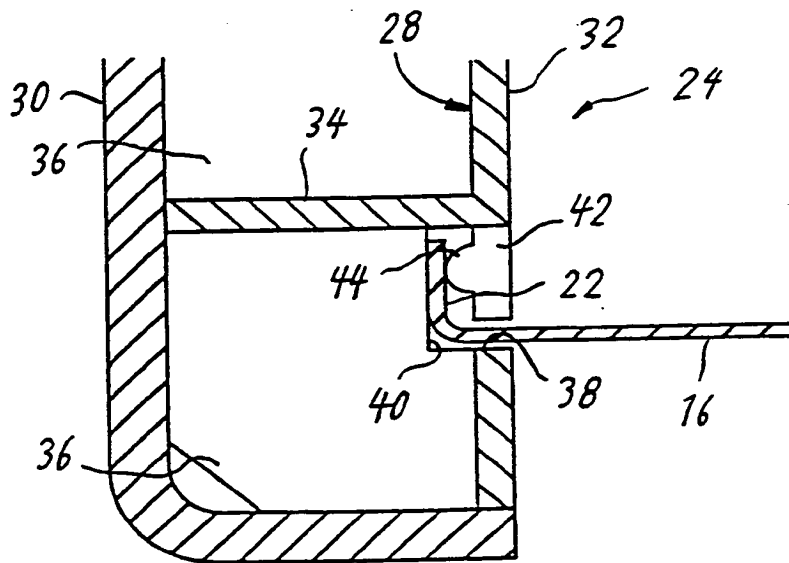


Fig. 2



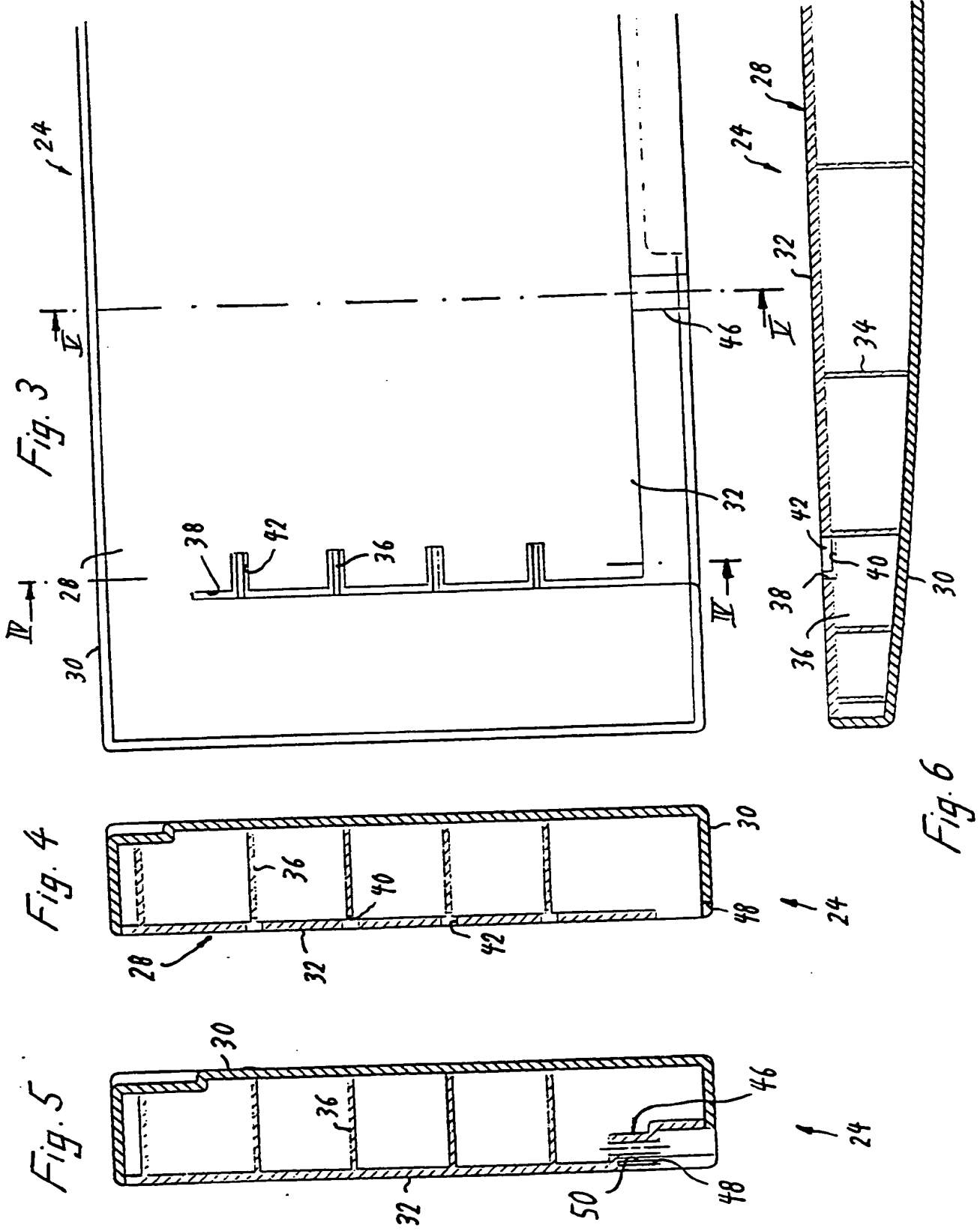


Fig. 7

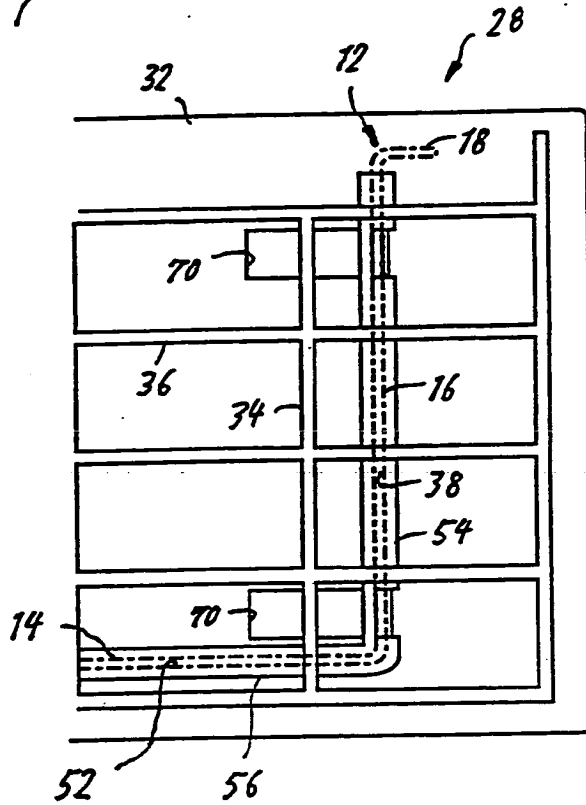


Fig. 8

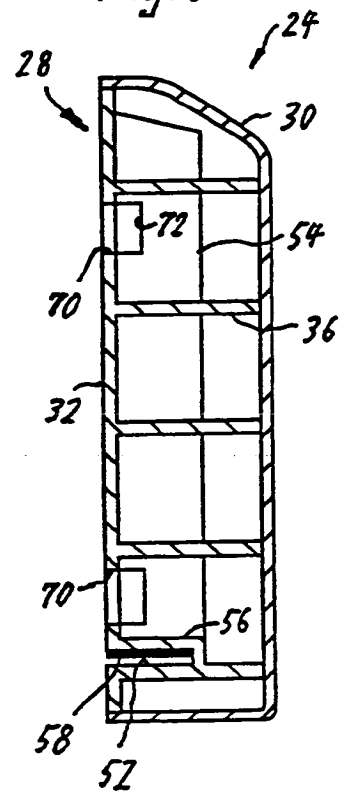


Fig. 9

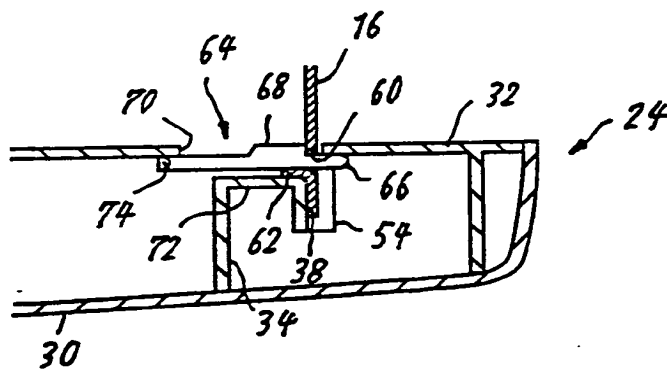


Fig. 10

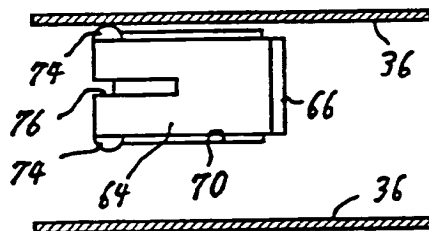
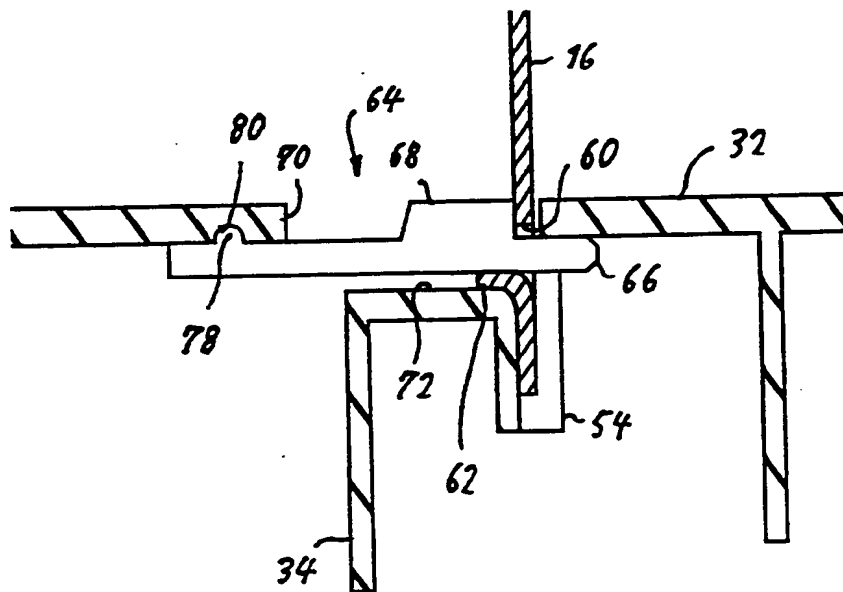


Fig. 11



DESCRIPTION  
A SHEET METAL DRAWER

The invention relates to a sheet metal drawer having a front part made from plastics material.

Conventionally, drawers comprise a box made from wood, plastics material or sheet metal closed at the front and rear and a front part of wood or plastics material located in front of the front wall of the box and by means of which the drawer is made to match the adjacent parts of the front of the item of furniture. In the domain of kitchen and office furniture, drawers in which the actual box is made from sheet metal have become increasingly more widespread. With some known drawers of this type the plastics material front part is screwed onto the front metal wall of the box. In some other constructions, an upper edge of the front part hooks behind the upper edge of the front sheet metal wall of the drawer and the lower edge of the front part is secured by screws to a flange on the sheet metal wall.

By means of the invention a sheet metal drawer is provided which has a front part made of plastics material, which can be easily produced and with which a clean aesthetically pleasing transition from the sheet metal part to the front part is achieved.

In accordance with the invention we provide a sheet metal drawer having a plastics material front part, characterised in that a sheet metal part forming the base and the side walls of the drawer is open at least at the front; and in that the front wall of the drawer is formed directly by the plastics material front part which is provided on its rear surface or on its edges with grooves in which the front edges of the sheet metal part and/or flanges on the sheet metal part engage.

In the case of the drawer according to the invention, the front extremity of the actual drawer is formed directly by the plastics material front part so that the front box wall of sheet metal can be dispensed with. As a result a substantial simplification of the production process is achieved since the connection between the front and side sheet metal walls which is expensive in terms of labour is no longer necessary. A solid seating of the front part on the sheet metal part of the drawer and an aesthetically-pleasing transition are achieved in that the front edges or angled flanges of the sheet metal part engage in corresponding grooves formed in the edges or in the rear surface of the front part. In this manner the steps and separating lines between the front metal wall and the rear side of the front part which are unavoidable in conventional drawers are dispensed with. Furthermore, at their free ends the sheets are held stably in the

grooves of the front part such that as a whole the drawer is highly stable without expensive corner connections having to be provided by means of rivets, welds, brazing or the like.

Preferably the rear wall of the drawer is also formed by a plastics material part which is connected to the sheet metal part in the same manner as the front part. In this case the base and side walls of the drawer are simply formed by a U-shaped folded sheet such that particularly simple and efficient production is possible.

In a particularly preferred embodiment the edges of the base and the side walls penetrating the grooves are directed upwards or inwards in the manner of flanges, and the front part or rear wall is pushed onto the flange from above. In the case of the rear wall, which does not need to project laterally over the side walls of the drawer, the perpendicular grooves in this instance can be formed in the lateral edges of the rear wall. In contrast, in the case of the front wall, vertical grooves are preferably provided in its rear surface. These grooves have an L-shaped cross-section corresponding to the flanges and penetrate as far as the lower edge of the front part. One solution to the problems regarding mould-releasing techniques in the production of the grooves may be provided in that the front part is a



hollow body formed from a rear part and a cover mounted thereon; in that the grooves are formed in the rear wall of the rear part and their depth is delimited by struts which are disposed in the hollow space of the hollow body, are injection-moulded in one piece on the rear wall and are directed at a right angle relative to the plane of the rear wall. The flanges, extending from the side walls of the sheet metal part, are preferably accommodated in recesses in the horizontal struts of the rear part; the rear wall of the rear part is preferably in each case provided at the level of the struts with mould-releasing slots for the recesses of the struts, which slots emerge at a right angle from the vertical grooves.

In a further embodiment the side walls and the base are not bent over, so that the front part can be mounted from the front onto the edges of the sheet metal part. In this manner a further simplification of the production process is achieved. The front part can be secured to the sheet metal part in that small apertures are stamped in the sheet metal and in that movable immobilising members are mounted on the rear side of the front part and engage in these apertures. If the immobilising members are likewise made from plastics material, the sharp metal edges can, however, lead to a certain degree of wear such that the connection between the sheet metal

part and the front part works loose over time. For this reason it is advantageous not to remove completely the metal stamped out of the apertures but only to bend it out of the apertures such that a tongue is formed which abuts flat against the immobilising members.

In the following preferred embodiments of the invention will be described in further detail and by way of example only with reference to the drawings, in which:

Figure 1 is a perspective exploded view of a drawer;

Figure 2 is a horizontal partial section through the front part and the front edge of a side wall of the drawer;

Figure 3 is a rear view of a front part for a drawer according to one embodiment of the invention;

Figure 4 is a section along the line IV-IV in Figure 3;

Figure 5 is a section along the line V-V in Figure 3;

Figure 6 is a horizontal section through the front part according to Figure 3;

Figure 7 is a front view of a rear part of a front part

according to a further embodiment of the invention;

Figure 8 is a vertical section through the front part according to Figure 7;

Figure 9 is a horizontal section through the front part in the vicinity of an immobilising member;

Figure 10 is a front view of an immobilising member; and

Figure 11 is an enlarged section of Figure 9.

In accordance with Figure 1 a drawer 10 comprises a folded sheet metal part 12 which forms the base 14 and the side walls 16 of the drawer and is open at the front and at the rear. Two flanges 18 are angled horizontally outwards from the upper edges of the side walls 16. Furthermore, on the front edge of the base 14 there is formed an upwardly-directed flange 20 and flanges 22 which are directed inwards at a right angle are provided at the front edges of the side walls 16. Corresponding flanges (not shown) are also formed on the rear end of the sheet metal part 12. A plastics material front part 24 is provided on its lower edge and on its rear surface with grooves which are not visible in Figure 1 and is inserted from above into the opening formed by the flanges 20 and 22, the flanges engaging in the associated

grooves. A plastics material rear wall 26 is inserted in a corresponding manner into the flanges at the rear end of the sheet metal part 12.

In accordance with Figure 2 the front part 24 is formed by a back 28 moulded in one piece from plastics material and a front cover 30 which is produced separately from the latter and is subsequently welded to the back. The back 28 comprises a rear wall 32 as well as vertical struts 34 and horizontal struts 36 which extend into a hollow space between the rear wall 32 and the front cover in the manner of a honeycomb. The rear wall 32 is provided on each side with a vertical groove 28 into which the front edge of the associated side wall 16 is inserted. The horizontal grooves 36 are in each case provided in the areas adjacent the groove 38 with recesses 40 which accommodate the flange 22 of the sheet metal part 12 and define the depth of the groove 38. In each case the rear wall 32 is provided at the level of the horizontal struts 36 with mould-releasing slots 42 which extend at a right angle from the groove 38 and through which the cores of the tool required for forming the recesses 40 can be removed when the rear part 38 is produced. In accordance with Figure 2 there is also formed on the inner surface of the rear wall 32 a vertical bead 44 extending parallel to the edge of the groove 38 such that the flange 22 is gripped between the

edge of the recess 40 and the bead 44. In this manner, in spite of the unavoidable curvature in the transition area between the flange 22 and the side wall 16, an accurate seating of the front part on the sheet metal part is ensured.

Figures 3 to 6 show a practical embodiment of the front part 24 illustrated in Figures 1 and 2 merely in the form of diagrammatic sketches. In accordance with Figures 3 and 4 the lower edge of the rear wall 32 is disposed at such a distance relative to the rear edge of the cover 30 that the flange 20 of the sheet metal part can engage behind the lower edge of the rear wall 32. Only in the vicinity of screw sockets 46 there is formed a groove or pocket 48 which is also open at the top and delimited at the front and in which the flange 20 engages with an accurate fit (Figure 5). For reasons of tool techniques, the width of the groove 48 is greater than the very slight thickness of the sheet metal of the flange 20. In order for the flange to fit precisely and snugly in the groove, the latter is narrowed at given points by means of vertical ribs 50.

When the front part 24 has been pushed onto the flanges 20, 22 of the sheet metal part 12, the screws (not illustrated) are screwed from below into the screw sockets 46 such that the edges of their heads engage

below the groove 48 under the base 14 of the sheet metal part. In this manner unintentional pulling up of the front part 24 away from the sheet metal part is prevented.

Figures 7 to 10 illustrate a further embodiment of the invention in which the front edges of the side walls 16 and of the base 14 of the sheet metal part are not angled such that flanges corresponding to the flanges 20, 22 in Figure 2 are not formed. The back 28 is provided with vertical grooves 38 for the side walls 16 and with a horizontal groove 52 for the base 14 of the sheet metal part 12. The grooves 38, 52 are in each case delimited by slots in the rear wall 32 and struts 54, 56 profiled in the manner of pockets. In a similar manner to the groove 48 shown in Figure 5, the grooves in the struts 54, 56 are also narrowed by individual ribs 58.

In accordance with Figure 9 the side walls 16 are provided with openings 60 out of which a tongue 52 is curved at right angles. An immobilising member 64, which is substantially in the form of a rectangular plate and of which the free end projects through the opening 60 in the side wall 16, is guided movably in the horizontal direction at the inner surface of the rear wall 32. The immobilising member 64 is chamfered on both sides at its edge 66 running into the opening 60 and engages with an

accurate fit in the intermediate space between the rear wall 32 and the tongue 62 such that the front part is locked, without play, on the sheet metal part of the drawer. Since the tongue 32 forms a relatively large abutment surface for the immobilising member 64, wear against the plastics material of the immobilising member is prevented even if there is frequent mechanical stress.

On its rear side facing the interior of the drawer, the immobilising member 64 is provided with a projection 68, which projects into an opening 70 in the rear wall 32 connected to the groove 38. The height of the immobilising member 64 and of the projection 68 is only slightly less than the height of the opening 70. Consequently the immobilising member 64 is guided by the engagement of the projection 68 into the opening 70 in such a way that it can only move in the horizontal direction. In addition, as a result of the projection 68, the displacement path of the immobilising member 64 is also limited in the horizontal direction. Finally, the projection 68 also acts as a handle when the immobilising member 64 is actuated. The vertical struts 34 are in each case provided in the vicinity of the immobilising member 64 with a transverse strut 72 which is inwardly offset relative to the rear wall 32 and connects the strut 34 to the strut 54 profiled in the manner of a pocket. The transverse strut 72 forms a

guide surface on which the sheet metal tongue 62 and immobilising member 64 are supported. The space between the left hand edge of the opening 70 in Figure 9 and the left hand edge of the transverse strut 72 is smaller than the thickness of the projection 68 such that the immobilising member 64 cannot fall into the hollow space between the rear part and the front part cover even in the unlocked position. However, in the unlocked state the immobilising member 64 can be pivoted to such an extent that its free end 66 emerges from the opening 70. However, complete removal of the immobilising member 64 from the opening 70 is normally prevented by locking members 74 which, according to Figure 10, engage behind the edge of the opening 79. A slot 76 formed between the locking members 74 in the immobilising member 64, however, allows the locking members to be pressed together resiliently. In this way, on assembly, the immobilising member 64 can be inserted through the opening 70 into the front part. Subsequently the immobilising member 64 is held fixed in the desired position by the locking members 74 and projection 68.

As can be seen from the enlarged section in Figure 11, on its end opposite the locking edge 66 the immobilising member 64 comprises a locking projection 78 which engages in a locking groove 80 in the inner surface of the rear wall 32 of the rear part. Since the locking nose of the



immobilising member 64 is retained without play between the tongue 62 and the rear wall 32, the locking projection 78 is held in locking engagement with the groove 80. In this manner unintentional loosening of the locking is prevented. If, however, the parts are to be unlocked, when the user moves the immobilising member 64 by means of the handle 68 towards the left hand side in Figure 11, then the thinner left hand end region of the immobilising member 64 can be resiliently deflected such that the locking projection 78 emerges from the groove 80.

CLAIMS

1. Sheet metal drawer having a plastics material front part, characterised in that a sheet metal part forming the base and the side walls of the drawer is open at least at the front; and in that the front wall of the drawer is formed directly by the plastics material front part which is provided on its rear surface or on its edges with grooves in which the front edges of the sheet metal part and/or flanges on the sheet metal part engage.

2. Drawer according to claim 1, characterised in that the sheet metal part is also open at the back; and in that a plastics material rear wall is likewise provided with grooves for accommodating the edges or flanges of the sheet metal part.

3. Drawer according to claim 1 or 2, characterised in that the sheet metal part is provided on its front edge with flanges directed inwardly from the side surfaces and from the base; and in that the plastics material front part can be pushed from above onto these flanges.

4. Drawer according to claim 3, characterised in that the front part is secured against being pulled upwards by screws or locking members disposed on its lower side and engaging on the sheet metal part.

5. Drawer according to claim 1 or 2, characterised in that the grooves of the front part extend into the rear surface thereof; and in that the front part can be pushed from the front onto the front edges of the side walls and of the base of the sheet metal part and is retained on the sheet metal part by means of locking or immobilising members engaging in openings in the sheet metal part.

6. Drawer according to any one of the preceding claims, characterised in that the front part is a hollow body formed from a rear part and a cover mounted thereon; in that the grooves are formed in the rear wall of the rear part and their depth is delimited by struts which are disposed in the hollow space of the hollow body, are injection-moulded in one piece on the rear wall and are directed at a right angle relative to the plane of the rear wall.

7. Drawer according to claims 3 and 6, characterised in that the flanges extending from the side walls of the sheet metal part are accommodated in recesses in the horizontal struts of the rear part; and in that the rear wall of the rear part is preferably in each case provided at the level of the struts with mould-releasing slots for the recesses of the struts, which slots emerge at a right angle from the vertical grooves.

8. Drawer according to claims 5 and 6, characterised in that the immobilising members are in each case guided displaceably in intermediate spaces between the inner surface of the rear wall and the struts parallel to the plane of the rear wall and are accessible through openings in the rear wall opposite the guide surfaces of the struts.

9. Drawer according to claim 8, characterised in that the immobilising members can be inserted in each case through the associated openings in the rear wall of the rear section into the front part and after insertion are secured by resilient locking members in the opening.

10. Drawer according to claim 8 or 9, characterised in that the immobilising members in each case comprise a projection which projects into the opening in the rear wall and only permits a limited displacement path in the direction perpendicular to the sheet metal plane.

11. Drawer according to claim 5 or any one of claims 8 to 10, characterised in that the sheet metal part comprises tongues which are curved out of the openings for the immobilising members and in each case form an abutment for the immobilising members.

12. Drawer according to any one of claims 8 to 11, characterised in that the immobilising member comprises at its end facing away from the sheet metal part a locking projection which engages in a locking groove in the inner surface of the rear wall of the rear part.

13. Drawer according to any one of the preceding claims, characterised in that the inside width of the grooves is larger than the thickness of the sheet metal; and in that the grooves in each case are narrowed at given points by ribs extending parallel to the mould-release direction.

**Patents Act 1977**

**Examiner's report to the Comptroller under  
Section 17 (The Search Report)**

**Application number**

**9206471.6**

**Relevant Technical fields**

(i) UK Cl (Edition K ) A4B

(ii) Int CL (Edition 5 ) A47B

**Search Examiner**

**M J PENNELL**

**Databases (see over)**

(i) UK Patent Office

(ii)

**Date of Search**

**11 MAY 1992**

**Documents considered relevant following a search in respect of claims**

**1-13**

**Category  
(see over)**

**Identity of document and relevant passages**

**Relevant to  
claim(s)**

**NONE FOUND**

**SF2(p)**

**up - c:\wp51\doc99\fil000419**

Category	Identity of document and relevant passages	Relevant to claim(s)

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